Annotation Schema

Below is the list of tags with a brief definition of the tag and an example.

Prefix Key

- De= Descriptor
- En= Entity
- Ex= Extent
- Li= Linguistic
- Met= Metadata (Radiologist's coding subset)
- St= Structural
- Sy= Synthesis

Group and Tag Type	**Description and Explanation**	**Example or Note**
Morphology:	*Morphology describes the object of interest's shape, structure and behaviour*	*NB morphology also gives indication of spatial extent*
Tag (De= Descriptor)	**Definition**	**Example**
De:Behaviour	The behaviour of the object of interest usually referring to metabolic activity and a measure of this. Behaviour falls into three general categories: Activity by the object or interest, invasion by the object of interest and reaction from the body.	SUV Max is 4.5, uptake, response, reaction, metabolic activity, activity, FDG uptake, invading, involving, extending
De:Structure	The shape and structure of the object of interest.	structure, shape, crescent, curved, confluent, depressed, enlarged, physiologically, structurally, appearance, nodular. NB: this is usually described as normal or abnormal in some way.
De:Size	**Direct Derivable**: Size refers to any numeric measurement of the object of interest. Please don't include qualifiers and words such as measuring	5mm, 4mmx3mm, 33 x 15mm, size
Topography:	*Topography locates the object of interest spatially*	*NB spatial location is broken down into three levels of specificity and includes extra-biological measures*
Tag (De= Descriptor)	**Definition**	**Example**
De:Laterality	**Direct Derivable**: The side of interest	right, left, bilateral, unilateral, ipsilateral, contralateral
De:Location	The finer locating information including body external locators	upper, lower, distal, apex, base, within, adjacent, posterior, anterior, medial, lateral, anterlateral, posterolateral

De:Site	**Direct Derivable**: The body part of interest. Note that for non solid tumours this will involve some non standard terms such as "serous sanguineous" (blood and fluid) because we need to relate behaviour that is specific to fluids, spaces and other things that are not really site but behave in the same way.	axillary, supraclavicula, anal, bowel, back, neck, leg, pelvic, side wall
Cytomorphology:	*Cell level morphology*	*NB: This will usually only be in the clinical history section, often mapping to a presenting diagnosis*
Tag (De= Descriptor)	**Definition**	**Example**
De:Cell Growth Pattern	**Currently unused**: The cell growth pattern contributes to the identification of the sub-type, so you might see a growth pattern turning up as a sub-type of a presenting diagnosis	pagetoid, lentiginous, hyperplasia
De:Cell Type	Description of the primary cell type in the entity.	lymphocytic, tissue cells, muscle cells, B-cell, small cell
De:Tissue Type	Description of the tissue type in the image.	soft tissue, tissue, bone marrow, grey/white matter
Type:	*Type is a sub-classification of something*	
Tag (De= Descriptor)	**Definition**	**Example**
De:Modality Type	Defines the specific scan used withing the broad category of the test modality of imaging.	CT, PET, bone scan, MRI, biopsy, FNA
Entities:	*Entities refer to objects of interest within a report. They are usually the subject of the report*	
Tag (En= Entity)	**Definition**	**Example**
En:Disorder	A disorder of fluid, gas or other noted by the radiologist or referring doctor.	effusion, ascites, swelling, lymphadenopathy, disease, necrosis
En:Generic Lesion	A non-cancerous anatomic or metabolic abnormality being described during the report	mass, focus, area, lesion, cyst, nodule, gallstone, it
En:Primary	**Direct Derivable**: The primary tumour being described by the radiologist. Cancerous. There may be more than one primary per report.	tumour, cancer, carcinoma, lymphoma, neoplasm, NHL, CLL, SCC
En:Recurrence	**Direct Derivable**: Recurrence of a pre-existing cancer	recurrence, recurrent, relapse
En:Metastases	**Direct Derivable**: Spread of cancer from one part of the body to another	metastatic, metastasis, metastases, mets, deposit, satellite
En:Node	A rounded mass of lymphatic tissue that is	nodes, node, nodal

	surrounded by a capsule of connective tissue. This tag picks up the entity itself and this entity will have certain values attached e.g. site, size, shape	
Extent:	*Extent refers to the spread within the body (or what can be seen of the body) of an object of interest*	NB: measurement of extent varies
Tag (Ex= Extent)	**Definition**	**Example**
Ex:Extent	**OVERTAG**: Extent of spread of the tumour. Used as overtag for any indication of extent (Evidence overtags not used in these cases) - including negative examples ('no invasion into...')	tumour extends through rectum, rib infiltration towards the right apex, spreading from x to y, gastric invasion, likely spleen and possible liver infiltration, pleural extension is noted, no epidural extension or compression has been identified
Ex:Clear	**OVERTAG**: No evidence of primary tumour or primary tumour cannot be assessed ***not used***	The lungs are clear, No evidence of regional tumour
Ex:In-Situ	**OVERTAG**: tumour in situ having variable size ***not used***	Today the mass measures 18 x 17mm in transverse dimensions
Ex:Invasive	**OVERTAG**: tumour invades to regional biology ***not used***	invades chest wall, extending to.., involving..., including..., involvement of..., The vesical mass clearly involves approximately the distal 2cm
Contextual Polarity:	*Defines existence or none existence of something on domain specific criteria*	
Tag (Li= Linguistic)	**Definition**	**Example**
Li:Evidence Negative	**OVERTAG**: Context dependent statement regarding evidence of polarity - existence.	not identified any abnormally elevated FDG uptake, lungs appear normal, elsewhere the parenchyma is clear, uptake in the level 5b nodal position has resolved
Li:Evidence Positive	**OVERTAG**: Context dependent statement regarding evidence of polarity + existence. Only evidence in support of the existence/progression (etc) of cancer.	intense FDG uptake of oral tongue, Increase in size of the liver metastases, evidence of abnormal lymph nodes below the diaphragm, demonstrates vivid enhancement, right middle lobe lung mass remains unchanged
Li:Judgement Negative	**OVERTAG**: Context dependent polarity (-) for existence concerning a judgement. This will usually map onto the synthesis tags and refers to the whole phrase or clause rather	This is not consistent with lymphoma, in keeping with inflammatory post radiation change, No evidence of

	than just a word. Includes evidence of other things that imply non-cancer and statements in the conclusion section that summarise the negative evidence in the report.	metastatic disease, more likely reflects inflammatory change rather than tumour recurrence, marked response to current chemotherapy
Li:Judgement Positive	**OVERTAG**: Context dependent polarity + for existence concerning a judgement. This will usually map onto the synthesis tags and refers to the whole phrase or clause rather than just a word. Only judgements suggesting the existence of cancer (or its components/effects/recurrence...) are consideed positive.	consistent with low grade residual disease, highly suspicious of a primary tumour, it is likely to have a small volume metastasis, may be metastatic, would be consistent with a renal cell carcinoma
Normality:	*Defines normality or abnormality of something at the lexical level. The value of this judgement varies by domain*	
Tag (Li= Linguistic)	**Definition**	**Example**
Li:Lexical normality negative	Lexical realisation of personal judgement of negative normality that can be confirmed or negated	abnormal, abnormality, atypical, irregular, unusual, heterogenous
Li:Lexical normality positive	Lexical realisation of personal judgement of positive normality that can be confirmed or negated	normal, typical, standard, average, physiologic, expected, background, clear, unremarkable, homogenous, within normal limits, within the range of physiological
Lexical Polarity:	*Defines existence or non existence of something (may be an abstract thing) at a lexical level*	
Tag (Li= Linguistic)	**Definition**	**Example**
Li:Lexical polarity negative	Lexically bound (either in a separate lexical item or as a suffix or prefix) polarity (-) that is modifying something else. It will be related by negation.	no, not, non, rather than, absent, exclude, lack, nil, negative, neither, nor, without
Li:Lexical polarity positive	Lexically bound (either in a separate lexical item or as a suffix or prefix) polarity (+) that is modifying something else. It will be related by confirmation.	seen, identified, consistent with, positive, evidence, signs, compatible with, appearance, confirm, demonstrate, describe, detected, in keeping with, indicate, note (*as in 'I note xxx' NOT 'findings of note'), noted, present, represent, show, visible
Modifiers:	*Modifies something (usually a head noun and usually concrete but may be abstract as well)*	*NB Include small volume as a modifier not a size*
Tag (Li= Linguistic)	**Definition**	**Example**
Li:Modality	modality of possibility and probability -	possible, probable, may be,

	words expressing (un)certainty	definitely, absolutely, clearly, ?, definite, differential, either, equivocal, likely, indeterminate, presume, appear, suggest, too small for metabolic assessment, unlikely
Li:Mood and Comment Adjuncts	Indication variation in degree or intensity, including some degree/intensity modifiers that are less standard but appropriate in the cancer context	slightly, negligible, little, small, large, dramatically, benign, borderline, considerable, decrease, diffuse, focal, further, elevated, extensive, intense, reduction, scattered, significant
Li:Numerative	Numerical count or tally	one previous test, two regional lymph nodes involved, three nodes appear enlarged, four staple marks, the third node
Li:Temporality	Any reference to temporal indicators. Also used to mark indications of change	previous, prior, post, 12.3.11, March 2010, yesterday, a while ago, residual, since, 3 month mark, earlier, new, old, change, degenerative, alteration, resolve, resolution, stable
Metadata:	*Domain specific information usually derived from the text but may be directly indicated within the text*	*NB These won't often turn up fully complete categories*
Met:Anatomic stage	**Direct Derivable**: Staging describes the extent or severity of a person's cancer. Knowing the stage of disease helps plan treatment and estimate the person's prognosis. This will be clinical or pathologic.	0, IA, IB, IIA, IIB, IV, Duke's B
Met:T value	**Direct Derivable**: the extent or spread of the tumor (T)	TX, T0, Tis, T1, T4A, mrT3b
Met:N Value	**Direct Derivable**: whether cancer cells have spread to nearby (regional) lymph nodes (N),	N0, NX, N1, N2B
Met:M Value	**Direct Derivable**: whether distant (to other parts of the body) metastasis (M) has occurred	M0, M1
Met:Report Purpose	**Classifier**: The reason why the test was carried out. This may be: *initial staging, post treatment, monitoring or restaging*	staging, initial staging, re-staging, characterization, evaluation
Structure:	*The shape and organisation of the text defined by the writer*	*NB Subheadings should be used sparingly*
Tag (St= Structure)	**Definition**	**Example**
St:Clinical History Heading	Any heading that pertains to the history of the patient	CLINICAL NOTES, CLINICAL DETAILS, CLINICAL HISTORY, Clinical indications, History

St:Conclusions Heading	Any heading pertaining to the conclusive summary generally present at the end of the report.	Conclusions, Conclusion, Concluding Statement, Comment, Impression
St:Findings Heading	Any heading that creates a boundary for the findings	Findings, Further Findings
St:Subheading	Any miscellaneous subheading that does not fall under the aforementioned structural headings tags, especially when there are multiple objects of interest that occur within a report or it is a combined report	Nodal metastases, Haematogenous metastases, Primary tumour, primary mass, extranodal disease, regional nodal disease, 1, 2, 3, target measurements, addendum, previous imaging
St:Test_Modality Heading	Any heading that pertains to test modality.	CT scan technique, PET Scan technique, Technique
Synthesis:	*Categories that require text level derivation by the writer*	*NB These are not always clearly conclusive*
Tag (Sy= Synthesis)	**Definition**	**Example**
Sy:Referring Question	**OVERTAG**: This referrs to the question asked of the radiologist by the referring doctor. It relates to but is not determinative of the test purpose since not all referring questions map onto test purpose categories.	? progression, ?residual, ? primary, ? lymphoma, ? therapeutic response, ?suitability for resection
Sy:Concluding Diagnosis	**OVERTAG**: This refers to the diagnosis provided by the radiologist - a named cancer. Includes site, does not include staging information.	residual lymphoma, B-Cell Lymphoma, Right sided breast cancer, colon cancer
Sy:Presenting Diagnosis	**OVERTAG**: The diagnosis with which the patient presents for imaging. Typically found under the clinical history heading and encompassing a temporal element. If multiple clinical history headings there may be a presenting diagnoses in each	I note history of cerebellar tumour excision, Previous right tonsillar SCC
Sy:Treatment	**Classifier**:Any mention of treatment previously given or recommended. Includes all medication names	therapy, radiation, radiation therapy, chemo, chemo radiation, surgery, resection, RCHOP, rituximab
Sy:Symptom	Any mention of symptoms in the patient. This includes those noted by the referring doctor, by the patient or by the radiologist.	SOB, unwell, pain, headaches, nausea
Sy:Lifestyle	Any mention of the patients lifestyle choices or personal characteristics in relation to the clinical history or presentation of findings.	overweight, smoker, heavy drinker, sun damage

Note: This tag sets could be updated and are slightly different from the annotation schema reported in the paper.